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**RCRA FACILITY INVESTIGATION
BETHLEHEM STEEL CORPORATION
STEELTON, PENNSYLVANIA
VOLUME 1
WORK PLAN & SUPPLEMENTS
SEPTEMBER 1991**



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EXECUTIVE SUMMARY

This RCRA Facility Investigation (RFI) Report has been developed to satisfy the requirements of an Administrative Consent Order pursuant to Section 3013 of RCRA, 42 U.S.C. Section 6934, U.S. Docket Number RCRA-III-011-AM issued by the United States Environmental Protection Agency, Region III (EPA) to Bethlehem Steel Corporation (BSC) on February 27, 1989, to define the identity, presence, magnitude, extent, direction, and rate of movement of any hazardous wastes or hazardous waste constituents which are present or have been released from the BSC, Steelton, Pennsylvania facility. EPA approved the RFI workplan on November 19, 1989 which defined three parts to the investigation; a Historical Investigation, a Field Investigation, and a Groundwater Investigation.

The Historical Investigation was begun in December of 1989. The focus of the Historical Investigation was to assess the degree to which the SWMUs identified on the site provided complete containment of Potential Contaminants of Concern (PCOCs) managed within the SWMUs. Further, the Historical Investigation was intended to identify additional PCOCs and pathways by which PCOCs might be released from the SWMUs. The Historical Investigation Report was submitted in March of 1990 with recommendations to modify the RFI Workplan based on the findings of that report. Those modifications, and modifications to the Quality Assurance Project Plan (QAPP) were approved by the EPA in May of 1990. Based on those modifications, the Field Investigation and Groundwater Investigation were implemented.

The purpose of the Field Investigation was to examine the nature of the materials contained within the SWMUs to assess the potential for those materials to pose a human health or environmental risk. Where releases of material were suspected, soil sampling was performed to further define the nature of any potential health or environmental risks. The data generated by these investigations was compared to site specific action levels developed through the use of an EPA screening model. Upon submission of an Interim Field Investigation Report and the results of the action level screening model, the EPA requested that BSC conduct additional investigations to include groundwater modeling using the Summers model for all PCOCs at all SWMUs, and, an assessment of the risk posed by the potential presence of hexavalent chromium on the site. These supplementary investigations were performed in August of 1991.

The purpose of the Groundwater Investigation was to assess the effects of suspected releases of PCOCs from two landfill areas; a residual waste landfill and a hazardous waste landfill located within the residual waste landfill. Groundwater monitoring wells were sampled in three rounds during 1990. The results of the analytical work performed on those samples were compared to National Primary and Secondary Drinking Water Standards (NPDWS and NSDWS) to assess potential risks to human health and the environment. In addition, surface water and sediment samples were obtained from the Laurel Run, a small, shallow stream located in the vicinity of the landfills, to assess the potential impact of groundwater releases from the landfills on the Susquehanna River. During the course of this investigation, the EPA requested that BSC undertake an additional investigation to assess the possible release of PCOCs from the landfill area via airborne transportation. An Interim Groundwater Investigation Report was submitted to the EPA in April of 1991.

This RFI report contains a description of the work performed, the data generated in the course of the investigations, a discussion of the findings of the investigations, and recommendations for further action. The report is organized in 5 volumes as follows:

Volume 1 contains the approved RFI Workplan and documentation pertaining to the various modification to the Workplan.

Volume 2 contains the results of the Historical Investigation, the Field Investigation, and the Groundwater Investigation, including the supplementary investigations pertaining to them.

Volume 3 contains the results of two modeling programs intended to establish site specific action levels and compare the results of the RFI investigations to those action levels. This volume also contains the results of the supplementary investigation regarding hexavalent chromium.

Volume 4 contains the results of an ecological evaluation of the site requested by EPA in April of 1991, the scope of which was significantly modified at the EPA's request in August of 1991.

Volume 5 contains the modified QAPP for the RFI as approved by the EPA on May 9, 1990.

The Historical Investigation examined the history of operations at the site including but not limited to the processes, materials, and material handling at the site which could potentially result in a release of PCOCs. This involved interviews with knowledgeable plant personnel, review of design drawings, review of historical aerial photographs, and document searches. Also as part of the Historical Investigation air monitoring was performed at various SWMUs to assess the potential release of volatile constituents (Appendix A). No volatile organic release was observed during air monitoring. Of the 27 SWMUs examined five were found to have been constructed and managed in such a manner as to preclude releases of PCOCs and were subsequently deleted from further investigation. At the remaining SWMUs, evidence of the release of PCOCs, of unknown nature and extent, was identified. Thus, the Field Investigation and Groundwater Investigations were commenced.

The Groundwater Investigation revealed evidence of the release of some PCOCs into the groundwater underlying the landfills. A geo-synthetic cap was installed over the hazardous waste landfill (SWMU 18) during the RFI which appears to have had a positive effect on groundwater quality in the area, which could be observed in the analytical data from monitoring wells over time. At EPA's request a supplementary study was conducted to assess the potential airborne transport of EAF dust from the landfill (Appendix H). The study did not indicate a release of EAF dust by these means. Further, risk evaluation, based on comparison of concentrations of PCOCs in the groundwater to NPDWS and NSDWS indicated that the releases identified did not pose a risk to human health or the environment. Thus, a recommendation of no further action was made.

The Field Investigation was conducted in two phases. In the first phase, water and sediment samples taken from SWMUs other than those related to Electric Arc Furnace (EAF) dust production were analyzed. SWMUs related to the production of EAF dust were not sampled because EAF dust is a listed hazardous waste (K061) and thus, were already expected to be included in the second phase of the Field Investigation. The results of these analyses indicated that PCOCs were contained within some SWMUs at levels, which under worst case scenarios, might pose a risk to human health or the environment. Thus, the second, soil investigation, phase of the Field Investigation was implemented. Soil samples were taken at four depths in proximity to the affected SWMUs. Those samples which revealed the presence of PCOCs at levels which might theoretically be hazardous were analyzed by the EP Toxicity method. None were found to be hazardous by virtue of characteristic toxicity. To evaluate the potential risk to human health and the environment, the maximum value for any PCOC identified at each SWMU was compared to two action levels generated through computer modeling, using models approved by the EPA. One SWMU was found to exceed the action levels developed. This is SWMU 24, the Electric Arc Furnace Spray Chamber Drop Legs which failed to meet the criteria for worker exposure to lead. There is no case in which a SWMU poses a threat to groundwater quality based on the Summers model. At the request of EPA a supplementary study was performed to assess potential worker exposure to hexavalent chromium (Volume 3, section 4.0). The study concludes there is no worker exposure to hexavalent chromium.

The Ecological Evaluation has not revealed evidence of observable stress to wetlands or surface water bodies proximate to the site.

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**BETHLEHEM STEEL COMPANY
STEELTON, PA**

RCRA FACILITY INVESTIGATION

**WORK PLAN FOR SOLID
WASTE MANAGEMENT UNITS**

SEPTEMBER 1989

PROJECT NO. 3855-05

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**BETHLEHEM STEEL CORPORATION
STEELTON, PENNSYLVANIA**

RCRA FACILITY INVESTIGATION

**WORK PLAN FOR SOLID
WASTE MANAGEMENT UNITS**

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**BETHLEHEM STEEL CORPORATION
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**BETHLEHEM STEEL CORPORATION
STEELTON, PENNSYLVANIA**

1.0 INTRODUCTION

A work plan for sampling, analysis, monitoring, and reporting of solid waste and solid waste constituents at the Bethlehem Steel Corporation (Bethlehem), Steel Production Facility, Steelton, Pennsylvania is being submitted for review and approval by the U.S. EPA. This work plan has been prepared using the terms of the Administrative Order RCRA III-011-AM as guidance. The purpose of this work plan is to define the identity, presence, magnitude, extent, direction, and rate of movement of any solid wastes which may have been released from the facility.

This work plan addresses the investigative requirements for the facility solid waste management units (SWMU) as identified in the Order. Attachment C to the Order, "Scope of Work for a RCRA Facility Investigation," outlines five tasks:

- Task I: Description of Current Conditions;
- Task II: RFI Work Plan Requirements;
- Task III: Facility Investigation;
- Task IV: Investigation Analysis;
- Task V: Reports.

This work plan is divided into seven sections which contain information specified by tasks I, III, IV, and V. Information specified by Task II is included in Volume II of the work plan. Some of these tasks have been completed as required and are presented as part of the work plan, others are not yet completed and the work plan outlines how these tasks will be accomplished. The work plan is divided into the following sections:

- Section 1.0 - Introduction;
- Section 2.0 - Site Location and History - provides a summary of plant history and other location-specific information;

- . Section 3.0 - Potential Sources and Associated Materials of Interest - discusses each SWMU with regard to location, history, construction, contamination types, and sources;
- . Section 4.0 - Site Characterization - presents a brief area and site geologic and hydrogeologic characterization;
- . Section 5.0 - Preliminary Public Health and Environmental Assessments - presents any possible potential public health and environmental impact from each SWMU;
- . Section 6.0 - Solid Waste Management Unit Investigation - outlines sampling and other data-gathering steps needed to investigate each SWMU; and
- . Section 7.0 - Reports.

The work plans being submitted are for the following SWMUs:

| <u>SWMU</u> | <u>Description</u> |
|-------------|--|
| 1-3 | Wastewater Settling Basins |
| 4 | Settling Basin Sump |
| 5-7 | Wastewater Treatment Lagoons |
| 8 | Wastewater Polishing Lagoon |
| 9 | Central Waste Oil Storage Tank |
| 10-11 | Continuous Caster Heavy Scale Pit and Fine Scale Pit |
| 12 | Pipe Mill Oil Separator |
| 13 | Pipe Mill Expander Pit |
| 14 | Small Rolling Mill Scale Pit (28" Rolling Mill Pit) |
| 15 | Medium Rolling Mill Scale Pit (35" Rolling Mill Pit) |
| 16 | Large Rolling Mill Scale Pit (44" Rolling Mill Pit) |
| 18 | HWM1 Landfill |
| 19 | HWM2 Waste Pile Storage Building |
| 20 | HWM3 Pelletizer |
| 21 | Pelletizer Runoff Tank |
| 22 | No. 2 Pelletizer |
| 24 | EAF Spray Chambers Drop Legs |
| 25 | Steel Foundry EF Baghouse Bin |
| 29 | Frog and Switch Grinder Cyclone Holding Room |
| 30 | Residual Waste Landfill |
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| 34 | Plant Canal |

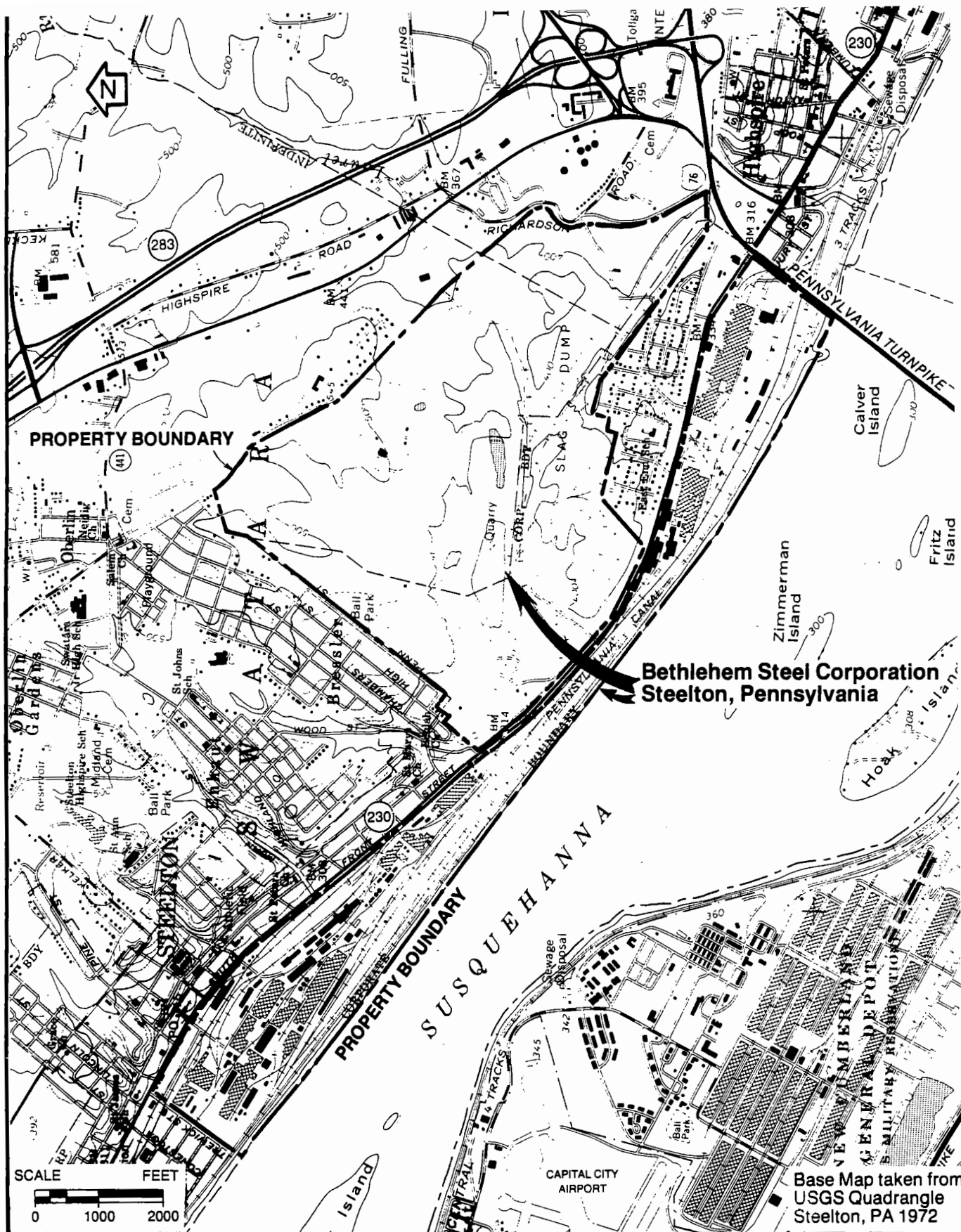
2.0 SITE LOCATION AND HISTORY

The Bethlehem Steel Corporation, Steelton, Pennsylvania plant is located approximately 1 mile southeast of Harrisburg (Figure 2-1), bordered on the southwest by the Susquehanna River, which flows to the southeast, and on the southeast by Laurel Run, an intermittent stream. The site is bordered by residential areas: the Borough of Steelton on the northwest, the Township of Swatara on the northeast, and the Borough of Highspire and the Township of Lower Swatara on the southeast. The site is approximately 4 miles long and occupies approximately 1,400 acres.

Construction of the plant began over 120 years ago by the Pennsylvania Steel Company, and in 1916 the plant was purchased by Bethlehem Steel. At one time the Steelton plant was a fully integrated steelmaking facility, which included coke ovens, blast furnaces, open hearth furnaces, and finishing mills. Iron making and coking operations were discontinued in 1961 and the associated plant areas dismantled in the ensuing four years. From 1961 until 1968, the open hearth furnaces were used for making steel from scrap. Starting in 1968, the open hearth furnaces were replaced with modern electric arc furnaces, which are still in use. Currently the Steelton plant produces rails, blooms, associated rail products, and expanded welded seam pipe.

The Steelton plant is presently comprised of the following operational facilities:

- . Steelmaking, rolling and finishing operations and foundry in the western portion of the plant;
- . Pipe mill and trackwork operations in the eastern portion;
- . Landfilling north of Front Street.



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SHEET NO.

DWN.BY:

SCALE:

DATE

DWG. NO.

CHK'D.BY:

APPR.BY:

Figure 2-1

**Bethlehem Steel Corporation
Steelton, Pennsylvania
Vicinity Map**

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3.0 POTENTIAL SOURCES AND ASSOCIATED MATERIALS OF INTEREST

Information pertinent to the current conditions of each SWMU is presented in the following sections. Historical, operational, and SWMU specific data including contaminants of concern, have been summarized to provide a general description of each unit. Data has been gathered from previous investigations, operational data, interviews with knowledgeable personnel, and site visits.

3.1 SWMU NUMBERS 1, 2 AND 3 -- WASTEWATER SETTLING BASINS

The settling basins (Nos. 1, 2 and 3 on Figure 3-1) are three rectangular basins each measuring 85.6 feet by 15 feet by 7 feet deep which provide separation of solids, oil, and grease from plant waters. These basins, which are concrete lined, were put in operation in the 1970s and are still in use. The basins run in parallel with an overflow weir located at the effluent end of each to provide flow control. Oil is removed using skimmers, collected in the settling basin sump (SWMU 4), and stored in an 8,000 gallon waste oil tank (SWMU 9) for reuse off-site as fuel. Settled solids are dredged from the basins using a clam shell bucket, loaded into a hopper car, and disposed on-site in the residual waste landfill (SWMU 30) at a rate of approximately 1,200 tons per year. Water flows from the basins to one of three treatment lagoons (SWMUs 5, 6, and 7), which provide secondary treatment.

The basins collect plant waters which contain iron scale, oil, and grease. The oils that may be present in the plant water include Nalco HM-20 Hot Mill Oil and Sunway Lubricant 90 which, according to the Material Safety Data Sheets (MSDS), contain naphthenic distillates, and 1659 Rando Oil HD 68 which, according to the MSDS, contains methacrylate copolymer. These or other oils may or may not have been present in the SWMUs since they were put in operation.

3.2 SWMU NUMBER 4 -- SETTLING BASIN SUMP

The settling basin sump (No. 4 on Figure 3-1) was constructed in conjunction with the wastewater settling basins, and receives all oil skimmed from the settling basins, in addition to other plant oil. The sump measures approximately 3 feet by 3 feet, is concrete-lined, and is located underground with the top open at ground level.